User Instruction & Installation Manual

FB280
Tungsten Halogen Searchlight

Product Reference Number:

B7163 – FB280 L.V Chrome
B7186 – FB280 H.V Chrome
B7169 – FB280 L.V Semi Gloss Black
B7179 – FB280 H.V Semi Gloss Black

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1 - Introduction

It is imperative that this manual is read carefully and understood before installing your equipment. For your future reference please keep this manual in a safe place.

Thank you for specifying a product from the Francis Searchlights range. All Francis products are designed to give complete customer satisfaction and are manufactured to the highest engineering standards in order to ensure optimum performance and service life.

The Francis FB range combines features proven over many years service in the most hazardous conditions in both marine and land installations.

In order to prolong the life and performance of your product, we recommend that you only specify Francis Searchlights spare parts. This will also ensure that any warranties on your equipment will not be invalidated. Information on spares ordering and parts is provided in this manual.

Should you ever need to contact Francis Searchlights Ltd. regarding your equipment, please quote the Product Serial Number at all times.

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2 - Safety Precautions

The following instructions must be adhered to, in order to ensure a safe working environment and the safety of the user.

Note: When unpacking or manoeuvring the searchlight into its fixing position, suitable lifting points must be used in order to prevent damage to the equipment or personal injury.

- Prevent rain, snow, condensation and water droplets from contacting the lamp as this may cause bulb failure and possible shattering;
- Quartz halogen bulbs run with a high internal pressure in excess of atmospheric. Whilst the construction is inherently strong, there is a slight risk of the bulb shattering;
- Never look directly into an illuminated searchlight as this may cause severe damage to eyesight. If it is necessary to inspect a lamp whilst in operation, always wear suitable protective goggles;
- Should it be necessary to examine the lamp with the front bezel removed, always use a protective shield and wear goggles to ensure a safe working environment;
- Never attempt to clean a lamp whilst in use;
- Searchlights get hot. Never touch the unit when lit and always allow 15 to 20 minutes for cooling down after turning the searchlight off;
- Never place anything on or cover the searchlight when in use;
- Ensure the lamp has cooled sufficiently before removal;
- If undue force appears necessary to remove the lamp, the equipment should be inspected by a competent person or contact the manufacturer;
- When breaking a lamp for disposal, care must be taken to ensure the glass fragments are safely contained. This operation must be performed out of doors in free air. In all circumstances refer to the lamp manufacturers instructions packed with the lamp;
- Due to the vast range of lamps available it may appear possible that more powerful lamps can be used in the equipment than for which it was designed. Even when the unit will physically accept a higher wattage or voltage lamp, this substitution is not recommended and is dangerous. This action will also void any warranties on the equipment.

Always refer to the lamp manufacturer’s technical data when dealing with lamps.

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3 - Technical Information

This product has been designed to operate in accordance with the product specification. The FB280 searchlight has the following features:

- All marine grade materials and fixings;
- Parabolic glass reflector;
- Stove enamel paint or chrome finish;
- 360° horizontal rotation;
- Vertical movement +90° to -30°;
- Toughened front glass;
- Tungsten halogen light source 12/24v or 110/230v;
- External lamp focus adjustment between 1° spot to 10°flood;
- Integral on/off switch;
- Enclosure protection to IP56;

The searchlight also performs to the following optical data:

Volts	Watts	Range @ 1 Lux	P.B.C.P. x 1000	Div*	Lamp Life (Hours)	Lamp Cap	Despatch Number
12v	100w	933M	871	3°	2000	GX6.35	D9848
24v	150w	960M	921	3°	300	GX6.35	D14795
24v	250w	1114M	1242	3°	2000	GX6.35	D4695
24v	250w	1360M	1800	3°	300	GX6.35	D9851
120v	300w	1150M	1323	4.7°	75	GX6.35	D16883
230v	300w	1200M	1250	4.7°	50	GX6.35	D16841

In order that the searchlight operates correctly it is imperative that competent personnel are responsible for the installation, operation and servicing of this equipment. Failure to adhere to this advice may cause premature failure or incorrect operation of the searchlight, which may damage the equipment or cause personal injury.

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4 - Unpacking and Installation Instructions

The following instructions should be read and fully understood prior to installing the equipment to ensure that the correct procedures are followed and all safety precautions are observed.

Note: If the equipment has been in storage for a considerable amount of time, it is advisable to conduct a routine maintenance check on all parts before installation.

Safety Precautions

This equipment should not be connected to an electrical supply before being installed. Installation procedures should be adhered to in order to ensure a safe working environment and reduce the risk of damage or personal injury.

Preparing the Mounting Position

Using the template provided mark out and drill the fixing holes through the deck. Fit the ‘O’ Ring in position and bolt the searchlight firmly down. On and uneven surface it may be necessary to use a suitable sealant such as silicone, in order to ensure a weatherproofed joint.

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5 - Electrical Installation

For safety purposes, only competent personnel should perform the electrical installation. All equipment should be installed to current Electrical Regulations and Standards.

In order to obtain the maximum light output from the searchlight, it is essential that the full operating voltage of the lamp fitted be applied to the lampholder contacts.

Method of Electrical Connection

1) Disconnect the supply before working on the electrical system;
2) The searchlight must be connected to a fused electrical supply, using suitably sized cable;
3) If the searchlight is located a considerable distance from the supply, provision must be made in the cable size in order to overcome the voltage drop. The following table should be used for indication purposes only:

Searchlight	12v 100w	24v 150w	24v 250w
Cable Size (mm^2)	Distance Max	Distance Max	Distance Max
1.5	2 MTRS	5 MTRS	3 MTRS
2.5	3 MTRS	8 MTRS	5 MTRS
4.0	5 MTRS	13 MTRS	8 MTRS
6.0	7 MTRS	20 MTRS	12 MTRS
10.0	15 MTRS	34 MTRS	20 MTRS

Searchlight	120v 300w	230v 300w
Cable Size (mm^2)	Distance Max	Distance Max
1.5	13 MTRS	24 MTRS
2.5	21 MTRS	39 MTRS
4.0	32 MTRS	62 MTRS
6.0	50 MTRS	96 MTRS
10.0	84 MTRS	161 MTRS

4) Whenever possible cable terminations should be made below deck and with approved terminal devices;
5) If a spare auxiliary fuse or circuit breaker is not available, one of the correct type and rating should be fitted and connected to a positive supply. It is advisable to locate a bus bar or main connection and avoid any direct connection to the supply:
6) For 110/220v AC products, the following colour coding system should be used for the customer supply cable:

Brown - Live
Blue - Negative
Green/Yellow - Earth

Note: This equipment must be earthed.

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6 - Operating Instructions

This equipment is designed for use out of doors, in free air. Never place anything on, or cover, the searchlight when in use as this may present a hazard.
The beam of the searchlight can be adjusted to give a variety of beam types. Using the external focus wheel, the desired beam can be achieved for any particular application.

This product should not be used for any purpose other than for which it was designed. Any modifications to the product should not be undertaken without consulting the manufacturer.

Setting to Work

Safe service in use necessitates the strict observance of the following precautions.

- Any article fabricated from quartz or glass is inherently fragile and care should therefore be taken, at all times, when handling lamps;
- Eye protection must be worn when handling lamps that have been removed from their packaging materials. The protective jacket should not be removed from the lamp for safety reasons, as there is a remote possibility of the lamp shattering violently, especially if it is subjected to mechanical shock or vibration;
- Always isolate the equipment from the supply before inserting a lamp;
- Before inserting the lamp ensure that all contacts are clean. Contacts must be renewed at the slightest sign of corrosion. Sanding or filing down corroded areas is not recommended as this will only make the conducting surface between the pin and lampholder smaller, thus causing the lamp to overheat;
- Do not twist or bend the fused quartz bulb when fitting the lamp as mechanical stresses MUST be avoided;
- The lamp must be capable of unimpeded expansion when it warms up to operating temperature. Mechanical forces must not be applied to the fused quartz bulb;
- Before the protective jacket is removed, suitable protection must be worn i.e face mask and gloves with wrist protection;
- Never touch the quartz bulb with bare hands, as fingerprints will make the glass cloudy and cause a severe loss of light. This may also cause recrystallisation and thus weaken the bulb material. Should the bulb be inadvertently touched, remove fingerprints with methylated spirit and a clean, soft paper towel. The bulb should then be wiped with distilled water. NOTE: ALWAYS WEAR MASK AND GLOVES DURING CLEANING);

In all circumstances the lamp manufacturer's data should be referred to when dealing with lamps.

When fitting the lamp:

- Always isolate the equipment from the supply when inserting a lamp;
- Ensure the circuit is suitably fused;
- Ensure the lamp is of the correct power rating and type;
- Check lampholder is in good condition. If the contacts show any sign of corrosion, replace the lampholder;
- Check the lampholder is in a good dry condition. Never allow water to collect in the lamp fitting or come into contact with the lamp.

To fit the lamp:

- Loosen all the thumbscrews on the front of the searchlight, remove the bezel and glass and store in a safe place;
- For easier access the light shield/spill ring may be removed by undoing the fasteners;
- Cut open one end of the protective sleeve surrounding the lamp;
- Using the sleeve to prevent the fingers coming into contact with the lamp, position the two pins above the holes in the lampholder;
- Gently push the lamp into the lampholder and remove the protective sleeve;
- Replace the light shield/spill ring and front bezel assembly, ensuring the thumbscrews are securely fastened.

Testing

Upon correct installation and connection to an electrical supply, the equipment can be tested in order to ensure its' correct performance. A competent person with some knowledge of electrical equipment must carry out this work.

Equipment required: Multimeter with leads
Ammeter

Using the equation P=VI, the approximate power output of the equipment can be calculated in the following way:

- Using the multimeter, take a voltage reading;
- Using the ammeter, take an amps reading from the live cable to the lamp;
- Multiply these figures together to give an approximate wattage (Power output).

For example:

Using a 240v 1000w Tungsten halogen lamp:
Voltage reading = 240v; Amps reading = 4 amps

Therefore, Wattage = 240 x 4 = 960 watts

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7- Fault Finding

All fault finding must be conducted by a competent person or qualified Electrical Engineer.

Failure of Lamp to light

Causes:

1) Power not supplied;
2) Fuse blown;
3) Failed lamp

Remedy:

1) Check voltage at supply. If supply is not present the fault is at the customer supply. If power is present, see remedy 2;
2) Check fuse for visual failure. If none noticeable check fuse for continuity using a multimeter. If fuse found to be faulty, replace with new part and test equipment again for correct working order. If found to be working correctly see remedy 3;
3) Firstly, check supply at lampholder connecting block (within searchlight barrel). If supply is present, disconnect unit from power supply before removing the lamp. If noticeable damage to filament is present, the lamp will have failed. The lamp can also be checked for continuity using a multimeter. Replace lamp ensuring all precautions and instructions previously outlined in this manual are adhered to.

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8 - Maintenance and Servicing

In order to prolong the service life and performance of your searchlight, the following maintenance guidelines are recommended:

- Maintenance checks should be conducted before very voyage or at least every three months;
- Before checking, disconnect the equipment from the supply;
- Visually inspect the condition of the equipment;
- Any major or minor structural damage should be rectified immediately in order to reduce sympathetic wear;
- After inspection it may be necessary to clean the inside of the searchlight. The following procedure should be adhered to:
    - Remove the front bezel;
    - Clean the front glass inside and out using a proprietary glass cleaner or metal polish;
    - Clean the reflector if required;
    - Check the reflector mounting gaskets. If signs of corrosion or damage are evident, replace as necessary;
    - Ensure that the lampholder is free from corrosion or other damage;
    - Check earthing point for conductivity;
- It is advisable to check all seals and gaskets for signs of degradation. Renew if necessary;
- The searchlight is fitted with an exhaust regulator. This ensures a steady airflow in order to prevent any vacuum forming within the barrel. In order to increase/decrease the airflow, the regulator can be adjusted using an Allen key.
- Upon completing all maintenance requirements the searchlight should be tested for full working order (approximately 20 minutes).

If in any doubt as to the correct servicing procedures to adopt please contact your distributor/agent or the manufacturer who will be able to advise the best course of action for your product.

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9 - General Assembly

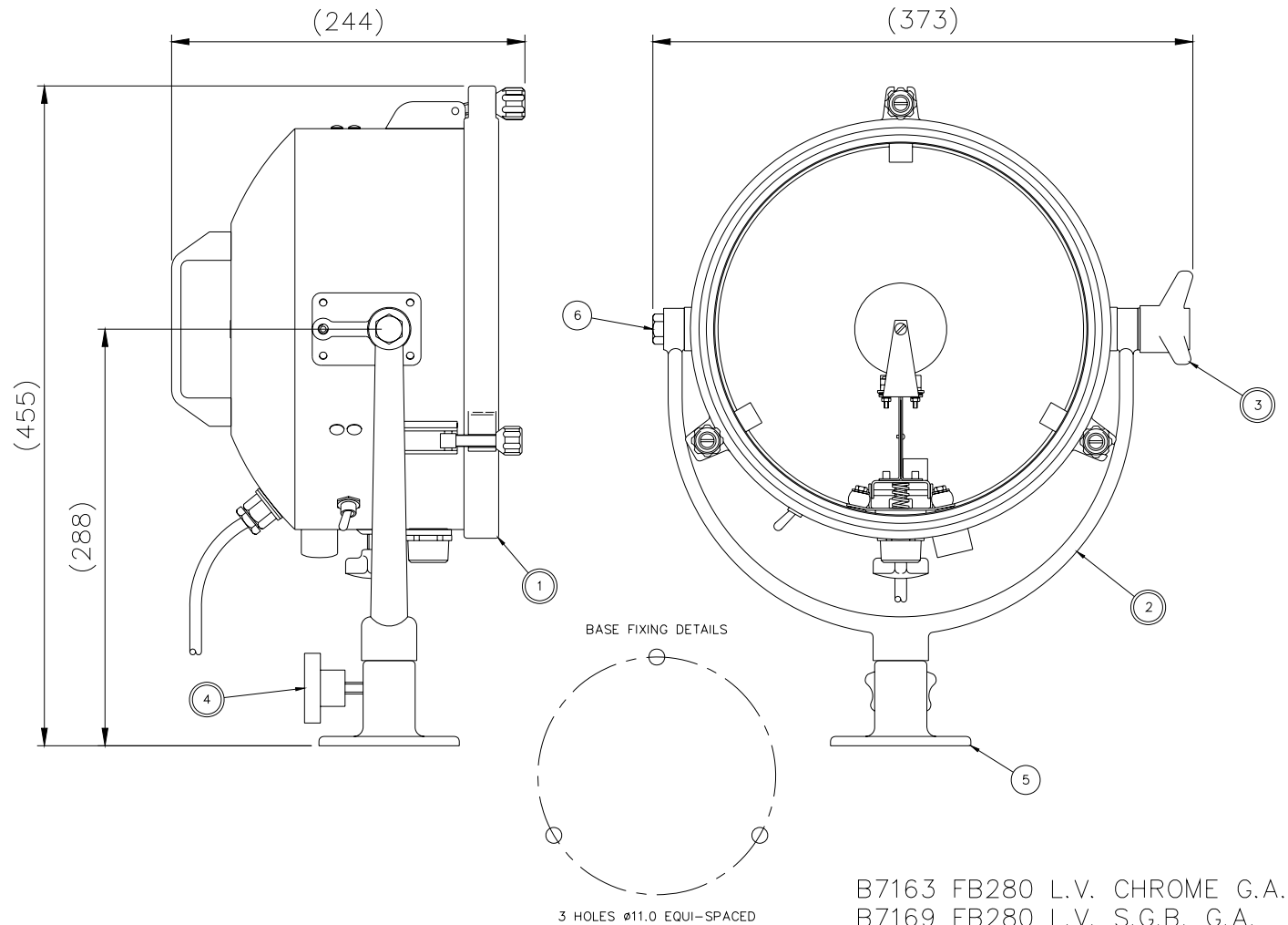
Drawing Number	Description
B7163	FB280 L.V.
B7179	FB280 H.V.

FIRST USED ON FB280 L.V. CHROME

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

0 10 20 30 40 50mm



BASE FIXING DETAILS

3 HOLES ø11.0 EQUI-SPACED ON A 82.0 P.C.D.

B7163 FB280 L.V. CHROME G.A.
B7169 FB280 L.V. S.G.B. G.A.

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	7.87 ACE
2	BROUGHT IN-LINE WITH DETAIL (EC0640)	5.98 D.S.
3	BROUGHT IN-LINE WITH DETAIL. DRG. No. NOW B7163 (EC0939)	6.01 D.S.
4	B7169 OPTION ADDED (ND10084)	8.01 D.S.

STANDARD PRACTICE
Deburr all cut/machined edges
Break corners R0.25(Max) U.O.S.

Francis SEARCHLIGHTS

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DRAWN	ACE	DATE	7.87	TOLERANCES	Sand Casting: To ISO 8062 CT10
CHECKED		SCALE	1:2	General: ±	Die Casting: To ISO 8062 CT8
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±

MATERIAL | FINISH | DESCRIPTION: FB280 L.V. G.A.

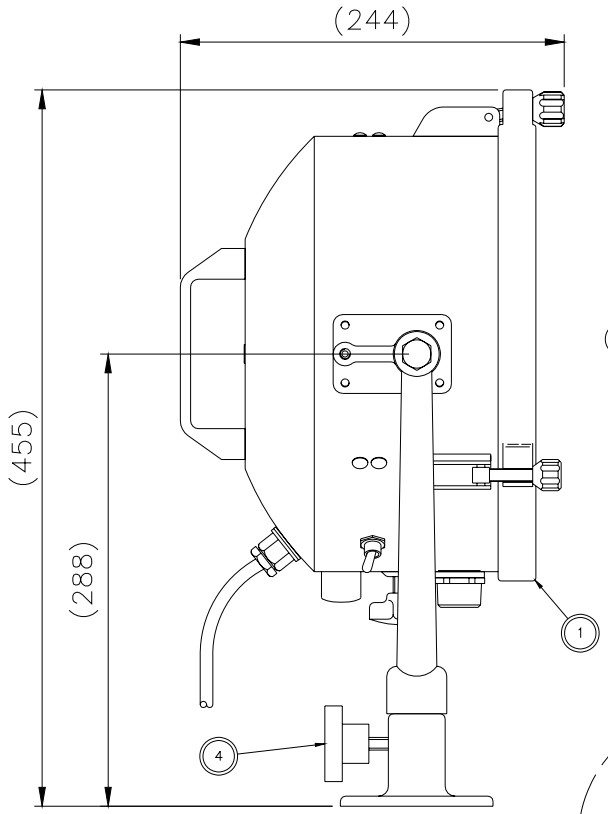
PART No./DRG No.: B7163 SHT 1

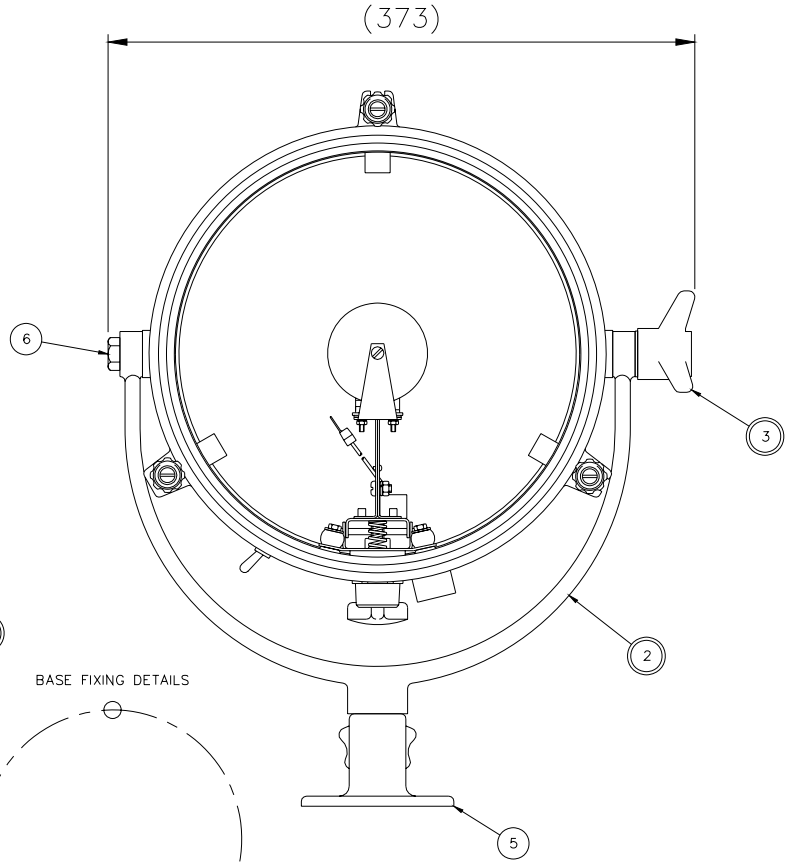
FIRST USED ON

DO NOT SCALE DRAWING

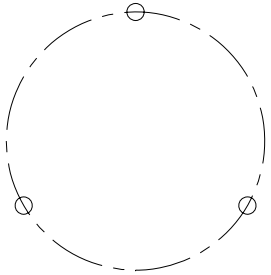
THIRD ANGLE PROJECTION

0 10 20 30 40 50mm





BASE FIXING DETAILS



3 HOLES ø11.0 EQUI-SPACED ON A 82.0 P.C.D.

B7186 FB280 H.V. CHROME G.A.
B7179 FB280 H.V. S.G.B. G.A.

ISS No	MODIFICATION DETAILS	DATE & INIT'S
1	AS FIRST DRAWN	9.01 D.S.

STANDARD PRACTICE
Deburr all cut/machined edges
Break corners R0.25(Max) U.O.S.

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CONT ON SHEET

DRAWN	D.S.	DATE	9.01	TOLERANCES	Sand Casting: To ISO 8062 CT10	MATERIAL	FINISH	DESCRIPTION	PART No./DRG No.	SHT
CHECKED		SCALE	1:2	General: ±	Die Casting: To ISO 8062 CT8			FB280 H.V. G.A.	B7179	1
ALL DIMENSIONS IN MILLIMETRES				Angular: ±	Hole centres & posns: ±					

10 - Spare Parts List

The following spare parts can be ordered directly from the manufacturer:

Part Number	Description	Part Number	Description
D9848	12v 100w T/H Lamp	C15396	Elevation lockwheel assy
D14795	24v 150w T/H Lamp	C14504	Base lockwheel assy
D4695	24v 250w T/H Lamp	C15607	Trunnion bolt
D9851	24v 250 w T/H Lamp	C06676	Reflector
D16883	120v 300w T/H Lamp	C14239	Rear handle
D16841	230v 300w T/H Lamp	C20070	Drainage plug
C20125	Exhaust regulator	C16893	Focus grommet
C13034	LV Lampholder con. Kit	C16875	HV Lampholder con. Kit
C09888	Focus wheel assy	C14501	Focus seal
C16761	A.V. mount	C08827	Focus spring
C16878	Lampholder HV/LV	C21443	Regulator cover
C09880	Switch	C08863	Front glass
C08866	Front glass gasket	C10055	Mirror clip s/assy
C02686	3 pin plug	C02685	3 pin socket
C14943	Red filter assy	C14944	Amber filter assy
C14945	Blue filter assy	C14946	Green filter assy
C14947	Clear filter assy	B7007	Tripod
B7001	30M LV cable reel	B7002	45M LV cable reel
B7003	90M LV cable reel	B7004	30M HV cable reel
B7005	40M HV cable reel	B7006	80M HV cable reel
B7016	12v Interrupter unit	B7017	24v interrupter unit

In order to prolong the life and performance of your product, we recommend that you only specify Francis Searchlights spare parts. This will ensure that any warranties on your equipment will not be invalidated.
When ordering spare parts please contact the Sales Department at Francis Searchlights Limited. Please quote searchlight model and serial number at all times. This will enable a fast response to your spares' requirements.

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